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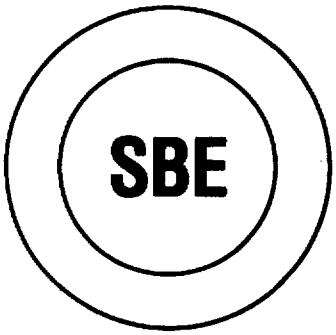
Comments of the Society of Broadcast Engineers, Inc.

ET Docket 95-18
Allocation of 2 GHz Spectrum for Use by the Mobile-Satellite Service

Third NPRM



February 3, 1999

SOCIETY OF BROADCAST ENGINEERS, INC.
Indianapolis, Indiana

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Section 2.106 of the	)	ET Docket No. 95-18
Commission's Rules to Allocate	)	
Spectrum at 2 GHz for Use by	)	
the Mobile-Satellite Service	)	

To: The Commission

Response of the Society of Broadcast Engineers, Inc. to Memorandum Opinion and Order and Third Notice of Proposed Rule Making and Order

The Society of Broadcast Engineers, Incorporated ("SBE"), the national association of broadcast engineers and technical communications professionals, with more than 5,000 members in the United States, hereby respectfully submits its comments to the November 27, 1998[1], ET Docket 95-18 *Memorandum Opinion and Order and Third Notice of Proposed Rule Making and Order* ("Third NPRM").

SBE Concurs with Proposed Re-Allocation but Suggests Seven Equal-Bandwidth Channels

1. Although SBE would, of course, have preferred to have seen no loss of the existing 120 MHz of 2 GHz TV Broadcast Auxiliary Services ("BAS") spectrum, or that replacement spectrum in another band had been provided, a proposal that leaves broadcasters with 85 MHz of spectrum is nevertheless better than the 70-MHz scenario that could have occurred as a result of the 1997 Budget Act. Therefore, SBE supports the reallocation proposed in the Third NPRM. However, SBE believes that the 2,025–2,110 MHz spectrum should be re-farmed into seven equal-bandwidth channels, as shown in the attached Figure 1, rather than six 12-MHz wide channels and one 13-MHz wide channel.

2. The problem with one 13-MHz wide channel is that it would effectively waste 1 MHz of 2 GHz spectrum. Receivers would be built to accommodate 12-MHz wide channels, meaning that the extra bandwidth of the one 13-MHz wide channel would not be used in practice, just as present-day 2 GHz TV BAS equipment is designed for only 17-MHz wide channels, and not for 18-MHz wide channels. SBE would therefore rather see seven equal

[1] Published in the Federal Register on December 17, 1998.

bandwidth channels, each with 12.142857 MHz of bandwidth, even though that results in non-even number channel edges, as follows:

Channel	Lower Channel Frequency	Upper Channel Frequency
A1n	2,025.000000 MHz	2,037.142857 MHz
A2n	2,037.142857	2,049.285714
A3n	2,049.285714	2,061.428571
A4n	2,061.428571	2,073.571428
A5n	2,073.571428	2,085.714285
A6n	2,085.714285	2,097.857142
A7n	2,097.857142	2,110.000000

3A. SBE sees broadcasters' use of the 2 GHz TV BAS band as falling into four categories:

Category I. "Los Angeles" or "LA." Extremely heavy use, mostly split channel. There is lots of itinerant use and channel borrowing and sharing; even so, seven channels aren't enough.

Category II. "Metro." Spectrum is heavily used, especially during the news hours. There is some split channel use, not a lot, and some itinerant use. There is regular channel borrowing and sharing.

Category III. "Light." There is some electronic news gathering ("ENG"), some fixed link, maybe even some channels mostly vacant most of the time. Typically, a small-market, low-competition situation.

Category IV. "Rural." ENG is unheard of, the use is for fixed, long-haul relays to small-market TV stations, to TV translator stations, and to cable television headends. In some areas not all channels are even used.

SBE notes, however, that Category III or IV situations may upgrade to Category II or even Category I virtually instantaneously upon the arrival (scheduled or not) of a major news or public interest event.

3B. The primary problems, of course, are that the new band plan must be able to accommodate the Category I areas, and that digital transmission does not take kindly to the type of analog channel sharing currently (and very delicately) practiced in the Los Angeles market.

Transition Issues

4. SBE concurs with the tentative Commission decision not to allow existing BAS systems to continue to operate on 17-MHz wide channels within the reduced 85 MHz of 2 GHz TV BAS bandwidth. Such operation would assuredly lead to massive interference and confusion between TV stations, TV network users, and cable network users.

5A. SBE also concurs with the tentative Commission decision to require simultaneous retuning or replacement of all 2 GHz TV BAS equipment nationwide on or by a date certain. First, SBE feels that it would be prudent to require Mobile Satellite Service ("MSS") entities to fund this conversion in advance, as this ensures that some broadcasters would not be "left holding the bag" should MSS default on its obligations half way through a phased-in approach. Second, MSS is, by its nature, nationwide (indeed, world-wide) in scope, and once an MSS provider has given a customer a radio it will be impossible to restrict operations only to those portions of the United States where TV BAS users have converted to the new band plan. Since MSS customers are likely to be highly mobile (otherwise less expensive cellular or Personal Communications Service ("PCS") telephones would suffice), those customers are going to insist on the ability to use their pricey MSS telephone anywhere they want. Therefore, a market-by-market, or geographically-based transition plan overlapping with MSS startup makes no sense and would be doomed to fail.

5B. As a practical matter, the cut over plan will probably have some market and frequency dependency, much like a military close-order formation drill, where one element must precisely clear the way for the next. This must be carefully orchestrated and fast-moving to maintain interoperability in adjacent and overlapping markets while retaining the ability to lend and borrow channels using on-the-fly coordination. In short, any geographic or frequency dependencies in the cut over plan must reflect the continuing operational needs of the broadcasters relinquishing spectrum, as opposed to the start-up desires of the new users claiming the spectrum.

6. It therefore follows that it would be inappropriate and unwise to allow existing 17 or 18 MHz-wide TV BAS equipment to continue to operate in some portion of the reallocated 2 GHz TV BAS spectrum. Such an option would lead to endless disputes between MSS and broadcasters over whether stations in a particular a market really need to convert and creates the potential for interference between Network operations and local stations. Network operations, because of their multiple sports and major event news venues throughout the United States, would have to maintain and transport two sets of equipment,

one set for the new band plan and the other set for the old band plan, which would not be practical. ENG trucks often go to other stations' markets to cover elections, and many TV stations have Satellite ENG ("SNG") trucks that travel extensively, again requiring two sets of equipment if a lengthy phased-in approach from the old band plan to the new band plan were to be attempted.

7. SBE agrees that a nationwide change over by a date certain will place a burden on equipment manufacturers, broadcasters, and MSS alike, but feels that these are burdens all three parties will have to live with. And if MSS is unwilling, or unable, to fund the cost of first relocating incumbent users under the Commission's *Emerging Technologies* policy, then it should not be allowed to start operations.

SBE Supports the Proposal to Leave to the Affected Parties Whether to Modify or Replace BAS Equipment

8. SBE supports the FCC proposal to defer to the business decisions made by the affected parties during negotiations as to whether it is most economical and efficient to "retune" existing BAS equipment or buy new equipment. First, SBE notes that "retuning" BAS radios to the new and narrower channels would have to include narrowing the intermediate frequency ("IF") portion of the radios as well, as it is the IF portion of a receiver that provides the receiver's selectivity; if only the center frequencies were changed there would be massive interference because the existing and wider receiver IF bandpass would be unable to reject adjacent-channel transmissions using the new band plan. Second, although equipment manufacturers have been in the process of developing hardware solutions for the band re-farming, it is still not known what options will ultimately become commercially available, either for re-farmed FM video analog radios or for newcomer digital radios, nor their cost. It therefore makes sense not to constrain either broadcasters or MSS parties at this time.

9. Indeed, there are still a plethora of unanswered questions regarding digital ENG radios, such as a) size, weight, and power consumption issues for applications sensitive to these parameters such as sports (*e.g.*, race car mounted radios, helmet cam radios) and news events (*e.g.*, man-pack radios at political conventions); b) ability of digitally-modulated signals to perform in interference-limited environments requiring sharp bandpass filters (*e.g.*, the sensitivity of digital signals to group delay errors near the band edges); c) latency concerns; d) lock up times after temporary signal loss; and e) the need for contribution quality

rather than just distribution quality feeds and whether heavily compressed digital signals can provide such quality.

It Is Imperative for the FCC to Adopt a Mandatory Transition Plan

10. SBE believes that it would not be feasible to allow the MSS and TV BAS communities to negotiate an appropriate transition plan; MSS parties have made it abundantly clear in their filings, many of which have been *ex parte*, that they feel they have no obligation to make broadcasters whole. Therefore, an FCC-mandated transition plan will be necessary to ensure (*i.e.*, force) MSS entities to honor their obligations.

11. SBE proposes the following mandatory band transition plan:

11A. SBE believes that two of the three protocols developed in the *Microwave Cost-Sharing* proceeding should be adopted: there should be a time frame for negotiations and replacement, and a good-faith requirement. With regard to the negotiation time frame, fairness demands that it not even start until a decision in this proceeding is rendered and published in the Federal Register. Since the Reply Comment deadline to this instant rule making is not until March 5, 1999, the soonest the negotiation period would be likely to be able to commence would be June 1, 1999, and even this date is optimistic, as it would require a Report and Order to be released and printed in the Federal Register by May 1, 1999. Then applying the proposed 1-year voluntary negotiation period and the proposed 1-year mandatory negotiation period would then mean that MSS could not commence operations until June 1, 2001. Thus, the desired MSS commencement date of January 1, 2000, will not be met.

11B. Because SBE supports a date certain, nationwide conversion to the new band plan, the issue of a sunset date, 10 years or otherwise, becomes moot, as all TV BAS equipment will have been converted before MSS operations can commence.

11C. SBE agrees with the Commission proposal that the good faith guidelines of Section 101.73 of the FCC Rules be applied to broadcaster-MSS negotiations. The Section 101.73 requirements are reasonable and fair, and any party bargaining in good faith has nothing to fear by being subject to them.

FCC Should Name NAB as the Transition Plan Administrator

12. SBE believes that a single industry organization should be identified to administer the transition, and believes that organization should be the National Association of Broadcasters ("NAB"), which has expressed the willingness to do so, and has the resources to fund such an undertaking (subject to eventual reimbursement by the benefiting MSS parties). SBE will offer what ever assistance it can to NAB in this effort.

13A. With regard to criteria for gauging the acceptability of replacement TV BAS equipment, SBE believes that any replacements or modifications that simply implement the new band plan and without adding new capabilities should be deemed as justified and acceptable. TV BAS users electing to purchase replacement equipment with added features should receive a pro rata share of the new equipment cost, unless such new features or abilities represent the most basic replacement equipment available. For example, if an existing TV Pickup radio is not frequency agile, but all replacement radios capable of operating on the re-farmed frequencies come with a minimum of two channels, then a replacement radio with two channels would be fully reimbursable. However, if a TV BAS user elected to purchase an upgraded version with, say, the ability to operate on all seven of the re-farmed channels, then the incremental cost of the added capability would not be reimbursable.

13B. Conversion to digital, especially in cases with special circumstances, must be considered. For example, it has become clear that highly portable digital equipment for point-of-view use will simply not be available within any time frame which could be considered in a transition scenario. By contrast, digital radios for permanent fixed uses are available now in similar frequency bands. Some fixed relay links will have to carry additional audio and/or data channels that simply cannot fit within 12 MHz in an analog format under any reasonable scenario. Such uses would likely be forced to convert to digital immediately to retain their present throughputs. If additional relay sites become needed due to the increased fragility of a high-order digital modulation scheme, that factor must not be ignored. Highly portable applications will have to make two transitions: one immediately, with continued use of FM video analog modulation, and a second conversion when digitally-modulated radios become small enough to be practical substitutes; this is only likely to occur after several generations of increasingly more compact and sophisticated digitally-modulated radios, and is probably at least five to ten years in the future. Therefore, this second transition, when it comes, would be at broadcasters' own expense.

13C. Lastly, the "LA" scenario, where "split channel" use with degraded quality has become the norm due to too many users, must be resolved. In such markets, ENG may be forced to digital conversion as part of this proceeding, ahead of any rational DTV ENG cut over schedule, because the choice of providing all users with degraded digital picture capability in a fractional channel, or of providing only some users with continuing analog operation, is really no choice at all. That this would likely involve equipment barely out of the prototype stage and at great cost would simply be the penalty for rushing the process.

SBE Supports Co-Primary Status for NASA, with Minor Revisions

14. SBE has long been a supporter of NASA and other government use of the 2 GHz BAS band for Earth-to-space and space-to-space operations on a secondary basis, as such use has not caused interference to terrestrial TV BAS operations, and no special operational techniques have been needed by broadcasters to protect NASA operations, as such operations use 2,025–2,110 MHz for uplinking, meaning that the interference threat from TV BAS is to spacecraft receivers, and not to NASA ground station receivers. Since NASA spacecraft are in non-geosynchronous orbits and employ highly directional receiving antennas, the threat window to spacecraft receivers is limited to small time windows for any particular TV BAS signal. Further, since the bulk of broadcasters' use of the 2 GHz TV BAS band is for ENG which is not continuously transmitting, any interference that has occurred has proven to be transitory and of no consequence to NASA.[2] Similarly, NASA ground station transmitters have not proven to be an interference threat to broadcasters' use of the 2 GHz TV BAS band, due to the fact that the NASA uplink sites are relatively few in number and employ highly directional transmitting antennas.[3] Additionally, NASA officials have indicated that there will be no significant increase in the number of such ground stations in the future.[4]

15. Because of this favorable history, SBE now supports the upgrading of NASA operations (and related governmental uses) to co-primary, but recommends two minor modifications to the proposed Footnote USYYY to Section 2.106 of the FCC Rules (Table of

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[2] Based on a December 17, 1998, conference call with NASA officials Mr. Wayne White, Chief, Spectrum Management Office & Agency Spectrum Program Manager; Mr. Pete Lowrey, Commercial Spectrum Program Manager; and Mr. James Hollansworth, Manager of Spectrum Advocacy, and Mr. Dane E. Ericksen of Hammett & Edison, Inc., Consulting Engineers, as Chairman of the SBE's FCC Liaison Committee, and Mr. Kenneth Brown of ABC, Inc., New York, an SBE FCC Liaison Committee member.

[3] SBE notes that there are currently only 13 such sites, according to Table A-2 of NTIA Special Publication 98-39, "Identification of Alternate Bands , Response to Title III of the Balanced Budget Act of 1997," dated November 1998. These 13 sites also appear in Footnotes US111, US219, and US222 to the FCC Table of Frequency Allocations.

[4] Based on the above-referenced December 17, 1998, telephone conference call.

Frequency Allocations). These modifications have been discussed with NASA officials, who have indicated that they would have no objection to the revised wording[5]. The proposed modifications are as follows:

> USYYY -- In the band 2025-2110 MHz, non-Government **use coordinated through, and supported by, NASA** for Earth-to-space and space-to-space transmissions may be authorized **on a secondary basis** in the space research and Earth exploration-satellite services subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to Government and non-Government stations operating in accordance with the Table of Frequency Allocations. [**added text bolded**]

While NASA officials point out that Footnote US90 to the FCC Table of Frequency Allocations already specifies the secondary basis for non-Government use of 2,025–2,110 MHz, SBE would prefer that the USYYY footnote stand on its own, so that there can be no misunderstanding that non-Government use of 2,025–2,110 MHz for Earth-to-space and space-to-space transmissions does not have the co-primary status afforded to Government use of these frequencies for Earth-to-space and space-to-space communications.

SBE Applauds Denial of Order Requested by ICO, et al

16. SBE applauds the Commission decision to deny the request by ICO Services Ltd.; TRW Inc.; COMSAT Corporation; C.S. Communications Co., Ltd.; BT North American Inc.; Hughes Telecommunications and Space Company; and Telecommunicaciones de Mexico for an Order requiring submission of information on 2 GHz TV BAS facilities, including location, equipment, and other technical and financial data. What SBE found offensive about the ICO, *et al*, request was its inclusion of frequency coordinators in the universe of parties that would have been subject to the order. TV BAS coordinators are generally private individuals who donate their time and resources; they are usually not Commission licensees themselves and therefore it is questionable whether the Commission would even have authority over them. What SBE finds appalling is that the MSS industry still doesn't appear to have a clue as to how the TV broadcast industry self-coordinates: namely, approximately 100 volunteer coordinators nation wide, sometimes operating with only the indirect support of their employer and funded only by donations. These volunteer coordinators typically maintain local databases of user names, frequencies, and call signs, but normally would not have information on the exact makes and models of the radios, their cost, or their age and condition. For the MSS industry to think that it can task such private, volunteer groups or individuals is

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[5] *Ibid.*

presumptuous and would require most frequency coordinators to report on data they do not even maintain.

17. SBE agrees that the recent Commission activity designed to update and correct its database of 2 GHz TV BAS licensees and equipment will be helpful to allow the Commission to establish sound policies. Two problems SBE sees in this on-going effort are (1) the inability of the software used by the Private Radio Bureau ("PRB") at its Gettysburg processing center to allow entering information on ENG receive-only sites and (2) the failure of TV BAS microwave licenses to track the maximum number of mobiles authorized under a TV Pickup license. Major market TV stations often employ several ENG receive-only sites, typically using either remotely-steerable directional antennas, or omnidirectional antennas, to receive ENG feeds directed at the appropriate site. These incoming feeds are then typically relayed to the TV station's news department by a fixed TV Relay link operating in the 7 or 13 GHz TV BAS band. SBE therefore urges the FCC to modify its software to allow entering the location(s) of a TV station's ENG receive only sites. With regard to the number of TV Pickup transmitters authorized by a TV Pickup license, older style TV Pickup licenses were supposed to indicate this information and often did, whereas new, computer-generated TV Pickup licenses do not show the number of transmitter. Therefore the updated Commission records will be of less use to MSS parties in determining the number of TV Pickup transmitters requiring modification or replacement.

Summary

18. The actions taken in this proceeding need to guarantee the continuity of TV BAS service to the American public. Besides providing high-quality programming for news and sporting events, TV ENG also provides time-sensitive and critical pictures of natural and man-made disasters, which government personnel at Emergency Operation Centers ("EOCs") often rely upon to dispatch and allocate emergency resources, especially in the early hours of the event. This public safety aspect of TV ENG must not be threatened or degraded.

List of Figures

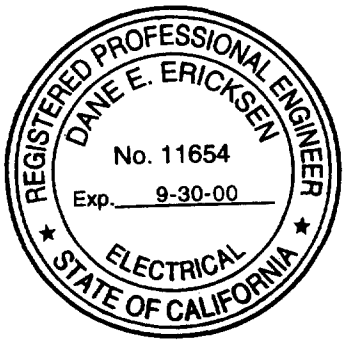
19. The following figures or exhibits have been prepared as a part of these SBE comments:

1. Figure showing existing versus proposed 2 GHz TV BAS band plans.

Respectfully submitted,

Society of Broadcast Engineers, Inc.

By _____
Ed Miller, CPBE, President



By _____
Dane E. Ericksen, P.E., CSRTE
Chairman, SBE FCC Liaison Committee

By _____
Christopher D. Imlay, Its Counsel

February 3, 1999

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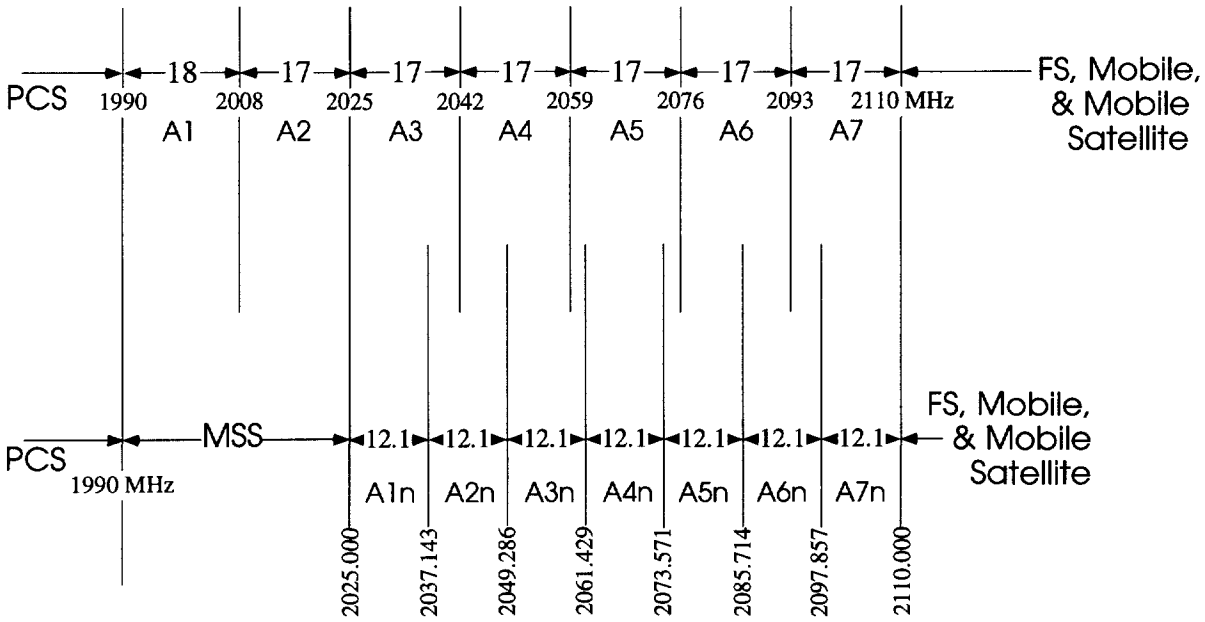
SBE Comments to ET Docket 95-18 Third NPRM

Existing v. Proposed 2 GHz BAS Band Plan

Existing Band Plan



New Band Plan

All frequencies and bandwidths are in MHz.